

REMARKS/ARGUMENTS

In response to the Office Action mailed September 27, 2005, Applicants amend their application and request reconsideration. In this Amendment, original claims 1-13 are cancelled and are replaced by new claims 14-21. Thus, claims 14-21 are now pending.

In view of the claims now presented, a more precise title is supplied to the patent application.

The invention concerns a method of forming the leads of a semiconductor device. Of course, "forming" means bending the leads that extend from a package including a semiconductor chip that has electrical connections to the leads that project from the package. The example provided in the patent application concerns preparing so-called gull wing leads but the invention is not limited to forming leads of any particular shape. In the invention, a semiconductor device package with its extending leads is placed between and supported by first and second bottom dies. The first and second bottom dies are part of a pair of die assemblies that also include first and second top dies. The respective die assemblies are laterally adjustable.

The separation between the die assemblies is changeable to accommodate semiconductor packages of different sizes. The bottom dies of the die assembly are adjustable in separation independent of the separation of the top dies. For example, a motor and a screw arrangement may adjust the separation of the bottom dies. The top dies are not adjusted simultaneously with or by the same mechanism that adjusts the separation of the bottom dies. Instead, a somewhat "automatic" adjustment of the separation of the top dies is provided in the invention.

The top dies are slidably mounted, in a described embodiment, on a platen so that the separation between the top dies can easily be adjusted. In the embodiment illustrated in Figure 3, a top die 28R is supported by rollers 38R so that the position of the top die can be adjusted with respect to the platen 26. As described in the patent application, particularly with respect to Figures 5-11, as the top die is moved downward so that the top die or a punch of the top die, comes in contact with the leads of the packaged semiconductor device, a horizontal force is produced, in the orientation of the figures, to

adjust the separation of the top dies. In the particularly described embodiments, through the use of a pair of cams and rollers, the separation of the top dies is adjusted through the force produced when the top die contacts the leads and urges the leads toward the bottom dies. These forces, which are horizontal in the figures, are produced by the oblique parts of the complementary bottom and top surfaces of the top and bottom dies.

New claim 14 explains the automatic adjustment of the separation of the top dies so that the separation corresponds to, i.e., matches, the separation of the bottom dies. The other new claims are based on original claims 2-5, 8, 10, and 11.

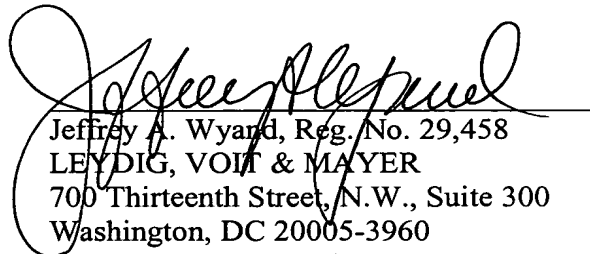
Many of the examined claims were rejected as anticipated by Downing (U.S. Patent 5,222,528). Other examined claims were rejected as obvious over Downing in view of various secondary references. All of these rejections, as well as the rejection of claim 4 as to form, are moot. However, the newly presented claims are discussed in relationship to Downing, to demonstrate that those claims are patentably distinct from Downing.

The pertinent figures of Downing are Figures 2-11 illustrating a lead forming apparatus and the operation of that lead forming apparatus. The lead forming apparatus 20, only one-half of which is illustrated in those figures of Downing, includes an upper clamping plate 21, an upper forming plate 25, and a shearing plate 29. At the lower half, the apparatus includes a lower clamping plate 23 and a lower forming plate 27. All of these elements can move together horizontally, as illustrated in Figures 3 and 4 of Downing. That movement locates a semiconductor package with a projecting lead 22 appropriately for forming the lead 22. Further, corresponding elements at the upper and lower sides of the semiconductor device can move in groups as illustrated in Figure 6 of Downing. According to the description in column 3 of Downing, beginning in line 47, the upper and lower forming plates 25 and 27 move together, horizontally, away from the semiconductor device package 33, along with the shearing plate 29. Then, when the lead is formed as indicated in Figure 8 of Downing, those forming plates 25 and 27 separate and, then, together, move horizontally to establish a second bend, as illustrated in Figures 10 and 11 of Downing.

The point of the foregoing discussion is that there is no description of a method in Downing, like the method of claims 14-21, in which a top die is moved laterally to coordinate its position with the corresponding bottom die, in response to urging of the top and bottom dies together while forming the leads of the packaged semiconductor device. Accordingly, Downing cannot anticipate any claim now pending. Further, a review of the secondary references applied in rejecting examined claims 2, 3, 5, 9, and 11 does not disclose any method or apparatus providing the "automatic" lateral top die positioning feature of the claimed invention.

Reconsideration and allowance of claims 14-21 are respectfully requested.

Respectfully submitted,


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